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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/883,039	06/15/2001	Jean-Paul Meraldi	34349-072824.0116	1278

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EXAMINER

FISCHER, JUSTIN R

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/883,039

Applicant(s)

MERALDI, JEAN-PAUL

Examiner

Justin R Fischer

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-38 is/are pending in the application.
- 4a) Of the above claim(s) 17-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-16 and 28-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 6-16, and 28-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi (JP 63134310) in view of Kikuchi (US 5,291,930). Takahashi is directed to a pneumatic tire construction having a belt reinforcement structure formed of "elongate composite elements" or cord-shaped fiber bundles containing a plurality of parallel, fiber filaments that are not twisted, wherein said elongate composite elements are impregnated with a thermosetting resin having a tensile modulus (analogous to modulus of claimed invention) of at least 150 kgf/mm² or 1.5 GPa. Takahashi suggests that a tire having the aforementioned belt reinforcement structure is lightweight and exhibits improved operating stability and rolling resistance (as compared to conventional, twisted cord reinforcement elements). In this instance, the fibers are described as high-strength and high modulus. Takahashi, however, fails to expressly define the claimed characteristics of the elongate composite element regarding (a) the elastic deformation in compression and (b) the breaking stress in compression, as compared to the breaking stress in extension. In any event, these properties are dependent on the particular resin and the particular fiber filaments used to manufacture the elongate composite element. In this instance, Takahashi discloses

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the use of (a) a high strength, high modulus fiber material and (b) a high modulus, thermosetting resin to form an elongate composite element in an analogous manner to that of the claimed invention, wherein the elongate composite element is preferably a belt-reinforcing element. Absent any unique processing, one of ordinary skill in the art at the time of the invention would have expected the elongate composite element of Takahashi to demonstrate similar properties (e.g. elastic deformation in compression) as compared to the elongate composite element of the claimed invention since these properties are a direct function of the fiber and resin used to form the elongate composite element. Takahashi does suggest an exemplary embodiment in which carbon fibers are used (disclosed as a suitable fiber by the claimed invention) and Kikuchi is further applied since it recognizes the alternative use of carbon and glass fibers in the manufacture of similar, elongate composite elements (Column 2, Lines 15-25), wherein one of ordinary skill in the art at the time of the invention would have found it obvious to use either material in the elongate composite element structure of Takahashi. As such, one of ordinary skill in the art at the time of the invention would have expected the elongate composite element of Takahashi, using either carbon or glass fibers, to exhibit the same compression properties required by the claimed invention- it is emphasized that the claimed invention suggests that carbon and glass fibers are suitable "substantially symmetrical technical fibers". Thus, in view of the makeup of the elongate composite element in Takahashi, one of ordinary skill in the art at the time of the invention would have found it obvious to form the tire construction of Takahashi with an elongate composite element having the claimed properties. Also,

Kikuchi directly attributes enhanced compression modulus to the formation of an elongate composite element due to the use of an impregnating resin without twisting said elongate composite elements (Column 2, Lines 15-25). Thus, Kikuchi recognizes improved compression properties due to this specific arrangement (elongate composite element) as compared to conventional twisted cords, such that one of ordinary skill in the art at the time of the invention would have readily appreciated enhanced compression properties in the elongate composite element of Takahashi. Lastly, applicant has not provided a conclusive showing of unexpected results to establish a criticality for the compression properties defined by the claimed invention. The details of Takahashi were obtained from the attached abstracts and an oral translation supplied by a USPTO translator.

It is initially noted that where the claims and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. Whether the rejection is based on "inherency" under 35 USC §102, on "prima facie obviousness" under 35 USC §103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by PTO's inability to manufacture products or to obtain and compare prior art products (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-4 (CCPA 1977)).

As set forth in the previous office action and above, Takahashi suggests the use of carbon fibers as a suitable reinforcing material for the elongate composite element. While Takahashi fails to expressly define the carbon fibers as "substantially

symmetrical”, applicant similarly suggests the use of carbon fibers (Page 4, Paragraph 10) and as such, carbon fibers are seen to constitute “substantially symmetrical technical fibers”.

Regarding claims 2 and 11, Takahashi suggests the use of a plurality of organic fiber materials, such as carbon fibers. While Takahashi fails to expressly suggest the use of glass fibers, one of ordinary skill in the art at the time of the invention would have found it obvious to use glass fibers in the elongate composite element of Takahashi since glass fibers represent a well-known material used in tire reinforcing elements, including elongate composite elements. In particular, the use of glass fibers would be consistent with the desire of Takahashi to use a lightweight, high strength, and high modulus material in the elongate composite element. It is noted that Kikuchi also suggests the use of glass fibers and carbon fibers alternatively in the manufacture of an elongate composite element (Column 2, Lines 67-68).

Regarding claim 3, Takahashi suggests the use of a plurality of high modulus, thermosetting resins, such as phenolic resins, melamine resins, unsaturated polyester resins, and epoxy resins. Although Takahashi is silent as to the glass transition temperature of the resins, the resins described by Takahashi are extremely similar to those identified by the claimed invention in that they are high modulus thermosetting resins and one of ordinary skill in the art at the time of the invention would have been able to appropriately select a resin depending on the specific use of the elongate composite element (e.g. what size of tire, what end count). In this instance, many of the resins described by Takahashi would have a glass transition temperature greater than

130 degrees Celsius, there being no conclusive showing of unexpected results in the original disclosure to establish a criticality for such a resin ($T_g > 130\text{ }^{\circ}\text{C}$).

With respect to claims 4, 12, 28, and 35 as previously stated, Takahashi teaches the use of a thermosetting resin having a modulus of at least 1.5 GPa, which encompasses the entire range of the claimed invention. In this same regard, there is no conclusive showing of unexpected results in the original disclosure to establish a criticality for any of the claimed ranges for the modulus.

Regarding claims 5 and 29, while Takahashi is silent as to the elastic deformation in extension and compression, Takahashi uses a similar, high modulus thermosetting resin to impregnate the elongate composite element, such that one would have expected the elongate composite element of Takahashi to have extremely similar properties as compared to that of the claimed invention. It is further noted that Takahashi suggests some exemplary fiber materials, including carbon fibers, which are identified by the claimed invention as a possible fiber material. Lastly, as previously stated, Kikuchi specifically attributes improved compression properties to an elongate composite configuration, as opposed to a conventional twisted structure- one would thus expect the elongate composite element of Takahashi to display enhanced compression properties, which is consistent with that required by the claimed invention.

With respect to claims 6 and 30, Takahashi describes the use of RFL, which is commonly used with tire reinforcing elements to improve adhesion with ply or topping rubbers.

Regarding claims 7-9 and 31-33, the elongate composite element of Takahashi is used as a belt reinforcing material, wherein said elements are disposed at equal and opposite angles (e.g. 20 degrees) in adjacent belt plies (example uses two belt plies- Pages 68 and 69).

With respect to claims 10, 11, and 34, Takahashi suggests a weight of at least 15%, preferably at least 30%, for the thermosetting resin. This suggests a weight for the fiber content of less than or equal to 85% and a preferred weight for the fiber of less than or equal to 70%, which incorporates nearly the entire range of the claimed invention. Also, Takahashi suggests a specific gravity of density of less than 3.0.

Regarding claims 13 and 36, one of ordinary skill in the art at the time of the invention would have expected the elongate composite element of Takahashi to have the claimed breaking stress in compression (at least 0.7 GPa) since it is formed of a similar high modulus, thermosetting resin, a similar fiber material having the claimed density, and a similar fiber/resin ratio, as set forth above. It is further noted that as stated above, Kikuchi specifically attributes improved compression properties to an elongate composite configuration, as opposed to a conventional twisted structure.

With respect to claims 14, 15, 37, and 38, the elongate composite element of Takahashi is circular (cord-like bundle). Although there is no specific teaching as to the diameter of the elongate composite element, one of ordinary skill in the art at the time of the invention would have readily appreciated a diameter of at least 0.4 mm since the elongate composite elements are being used as reinforcing elements in belt reinforcement structures of trucks and buses where larger reinforcing elements are

normally associated. It is further noted that a diameter of 0.4 mm is recognized as being a small diameter in the context of it being used in a belt reinforcement structure of a truck or bus, such that one of ordinary skill in the art at the time of the invention would have readily appreciated a diameter of at least 0.40 mm in the elongate composite element of Takahashi.

Regarding claim 16, one of ordinary skill in the art at the time of the invention would have expected the elongate composite element of Takahashi to have the claimed elastic deformation in compression (at least 3%) since it is formed of a similar high modulus, thermosetting resin, a similar fiber material having the claimed density, and a similar fiber/resin ratio, as set forth above. It is further noted that as stated above, Kikuchi specifically attributes improved compression properties to an elongate composite configuration, as opposed to a conventional twisted structure.

Response to Arguments

3. Applicant's arguments filed January 26, 2004 have been fully considered but they are not persuasive. First, applicant contends that no mention of the "substantially symmetrical" feature has been made. As noted above and set forth in the previous office action, Takahashi and the claimed invention similarly suggest the use of carbon fibers to form the elongate composite element- these fibers are described by the claimed invention as being suitable for the manufacture of an elongate composite element having the desired properties. Thus, carbon fibers are seen to constitute

"substantially symmetrical technical fibers". As noted above, the claimed invention suggests the use of carbon fibers on Page 4, Paragraph 10.

Second, applicant contends that the examiner refers to the resin chosen by Takahashi but ignores the differences between the fibers of the present invention and thus the examiner has overlooked the fact that patentability can rest on the selection of a particular fiber. It is agreed that the specific properties of the elongate composite element are a function of not only the specific resin but also of the specific fiber. However, as set forth in the previous office action (middle of Page 5), it is pointed out that not only does Takahashi describe a similar, high modulus thermosetting resin but the reference also includes embodiments in which carbon fibers are used to form the elongate composite element. Thus, Takahashi discloses the same resins and fibers as compared to the claimed invention. In this regard, one of ordinary skill in the art at the time of the invention would have expected the elongate composite element of Takahashi to exhibit extremely similar properties as compared to the elongate composite element of the claimed invention since the properties are a direct function of the type of resin and fiber absent any unique processing.

Regarding Kikuchi, the reference is applied to illustrate the improvement of compression properties when an elongate composite is formed (Column 2, Lines 15-25)- this is consistent with the requirements of the claimed invention in which the elastic deformation in compression is at least 2% and the breaking stress in compression is greater than the breaking stress in tension.

As to dependent claims 2-16, the examiner erroneously identified glass fibers as being an organic reinforcing material; however, the examiner's previous position that glass fibers are recognized as being "high strength" and "high modulus" is consistent with the type of fibers desired by Takahashi. It is further noted that Kikuchi recognizes the use of both glass fibers and carbon fibers in the manufacture of an elongate composite element- these materials are extremely well known in the tire industry for their comparable reinforcing capabilities (in relation to steel) and lightweight characteristics. Applicant has not provided a conclusive showing of unexpected results to establish a criticality for the use of glass fibers (the data on Page 13 only compares tires having the inventive elongate composite element with tires having conventional steel cords). It is emphasized that Takahashi is directed to a fiber material having high strength and high modulus, wherein the weight of tire is minimized. In view of these desired properties, one of ordinary skill in the art at the time of the invention would have found it obvious to select glass fibers since they represent a well-recognized tire reinforcing material that exhibits the above noted properties.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is **(571) 272-1215**. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Justin Fischer

April 8, 2004


SAM CHUAN YAO
PRIMARY EXAMINER